

*EXHIBIT 3 - Corliss Declaration*

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**MEMORANDUM**

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**TO:** Rao Ponakala  
Glenn Corliss

**cc:** Ihab Bishay  
Karen Ferraro

**FROM:** Beth Woytek

**DATE:** April 7, 2000

**SUBJECT:** **SENSORY EVALUATION REPORT FOR SS#3494(01-02) -  
NEOTAME/SWEETENER BINARY BLENDS IN PEPPERMINT CHEWING  
GUM - DESCRIPTIVE PROFILE RESULTS**

Study protocol -

Protocol for Sensory Evaluation with Ingestion of NC-00723 (Neotame) in Foods and Beverages,  
IRB Protocol #2624, amended 1/21/99

Protocol Managers-

Ihab Bishay, Director, Delivery Systems and Sweet Taste, The NutraSweet Kelco Company, A unit of  
Monsanto Company

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Prepared by: Beth Woytek

Approved by: Ihab Bishay

**Sensory Study #:** 3494(01-02)  
**Product Tested:** Peppermint Chewing Gum  
**Test Dates:** 2/22/00 - 2/25/00  
**Panelists:** Trained Mt. Prospect area consumers (n=8 with 2 replications)  
**Location:** Mt. Prospect, IL  
**Objective:**

1. To evaluate the similarities and differences of peppermint chewing gum sweetened with neotame/sweetener blends.
2. To determine if blending various sweeteners with neotame in a peppermint chewing gum improves the sweetness and/or flavor profile of the gum over that with only the single sweetener. Results in this study will be compared to evaluation with single sweeteners in SS#3444.

**Samples:**

- 1) 100 ppm Neotame (NTM) - NB#1690-151
- 2) 50 ppm NTM / 1500 ppm Aspartame (APM) - NB#1690-181
- 3) 50 ppm NTM / 1600 ppm Acesulfame-K (Ace-K) - NB#1690-184
- 4) 50 ppm NTM / 500 ppm Saccharin - NB#1690-187
- 5) 50 ppm NTM / 300 ppm Sucralose (using bulk Splenda<sup>®</sup>) - NB#1690-178
- 6) 50 ppm NTM / 30% Sugar - NB#1690-211

Samples were prepared at Mt. Prospect and held frozen until tasting. The neotame used was Lot#96NK008-8. Refer to Notebook #1690 for formulation and preparation details.

**Test Method:** Descriptive Flavor Profile  
Trained Mt. Prospect area consumers, n=7-8

The sensory profiling of the nine chewing gum prototypes was carried out using the Spectrum Method<sup>1</sup> of Descriptive Analysis. This method employs extensive sensory training to familiarize the panel with a product category, exposing the panelists to flavor attributes of the category as well as conducting in-depth practice sessions in the use of a fifteen point scale for describing intensity differences. The scale enables the trained panelists to indicate the sensory intensity of each flavor or texture attribute in a universal context, where 0 indicates "none" of the attribute present, 2 approximates "trace/threshold" intensities, 5 "slight or low" level, 7.5 "moderate" intensity, 10 "strong" and 15 "extreme".

Prior to evaluating the test samples, the panelists were presented with flavor and basic taste references to familiarize themselves with the different descriptors. Panelists evaluated the chewing gum over twenty minutes. To minimize fatigue, the six test samples were evaluated over two sessions, three samples presented during each session. Over the two sessions, the samples were presented to the panelists in a balanced order, unwrapped, in 2 ounce plastic cups randomly coded with three-digit numbers. Samples were assessed in duplicate. Panelists had a 10 minute break between each sample to minimize carry-over effects. Still water, crackers and unsweetened applesauce were available as palate cleansers before and between samples.

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<sup>1</sup> Reference: Meilgaard, M., Civille, G., Carr, B.T., Sensory Evaluation Techniques, CRC Press: Boca Raton, FL 1987; pp.119-141.

### *Data analysis*

Attribute scores were averaged across panelists. An analysis of variance (ANOVA) was performed on the data. Visual comparisons of sensory characteristics were drawn by spider plots/star diagrams.

**Key Findings:** Blending each of the sweeteners with NTM at a 50:50 ratio, extends the sweetness beyond that of the individual sweeteners in a peppermint chewing gum. There was no effect from NTM blending on the mint flavor profile as compared to the 100% NTM control.

#### Sweetness up to 2 minutes chew time (maximum intensity)

At 15 and 30 seconds, the Sugar/NTM was sweeter than all samples. By 2 minutes, the 100% NTM control was perceived to be sweeter than the APM/NTM, Ace-K/NTM, Sucralose/NTM, and Sugar/NTM; it was similar in sweetness to the Saccharin/NTM blend.

#### Sweetness between 2 and 20 minutes chew time

From 2 minutes until the end of tasting, the sweetness differences began to shift. All NTM blends except for Sugar/NTM became similar to the NTM control. However, between 10 and 16 minutes, the NTM control was once again perceived to be sweeter than all of the blend samples.

#### Sweetness at 20 minutes chew time (end of chewing time)

At the end of chewing, 20 minutes, there was no significant difference in the sweetness of the NTM control and blend samples.

#### Bitter:

Throughout the evaluation of the chewing gum samples, the bitterness ratings were very low in intensity – below a “trace” level on the 15 point scale. Even though there were some differences at various time points throughout the chew, overall bitterness was not an important attribute for distinguishing between the samples.

#### Minty Flavor and Cooling Mouthfeel:

After 15 seconds of chewing, the Sugar/NTM blend was slightly more minty and cooling than the other blends and the NTM control. Over the next 20 minutes of evaluating the gum samples, there were no differences perceived in either the minty flavor or the cooling mouthfeel.

#### Comparison to Single Sweetener

Although no statistical comparisons were made, as can be seen in graph 2, all of the NTM blend samples had higher sweetness intensities after 20 minutes of chewing than when used as single sweeteners in peppermint chewing gum. Graphs 3 through 7 also illustrate the sweetness extension effect of blending with neotame on the full sweetness profile of the chewing gum samples.

**Next Steps:** Through phase I (single sweeteners) and phase II (binary blends), it has been demonstrated that NTM does in fact improve the sweetness profile of peppermint chewing gum sweetened with commercially used high intensity sweeteners and sugar. Possible next steps would be to determine if blending also provides improvements in overall liking.

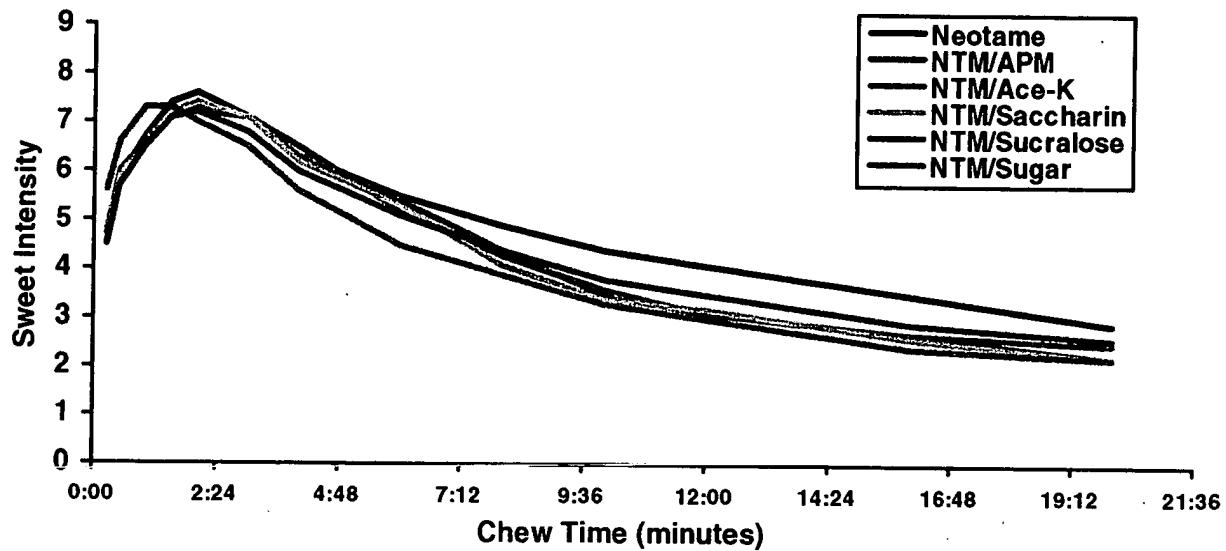
Phase III of the blend study is to look at the effect of adding NTM as one component of tertiary blends. It would be suggested that NTM be looked at in blends that currently exist on the market, ie. APM/Ace-K and sugar/APM/Ace-K blends.

**Attachments:**

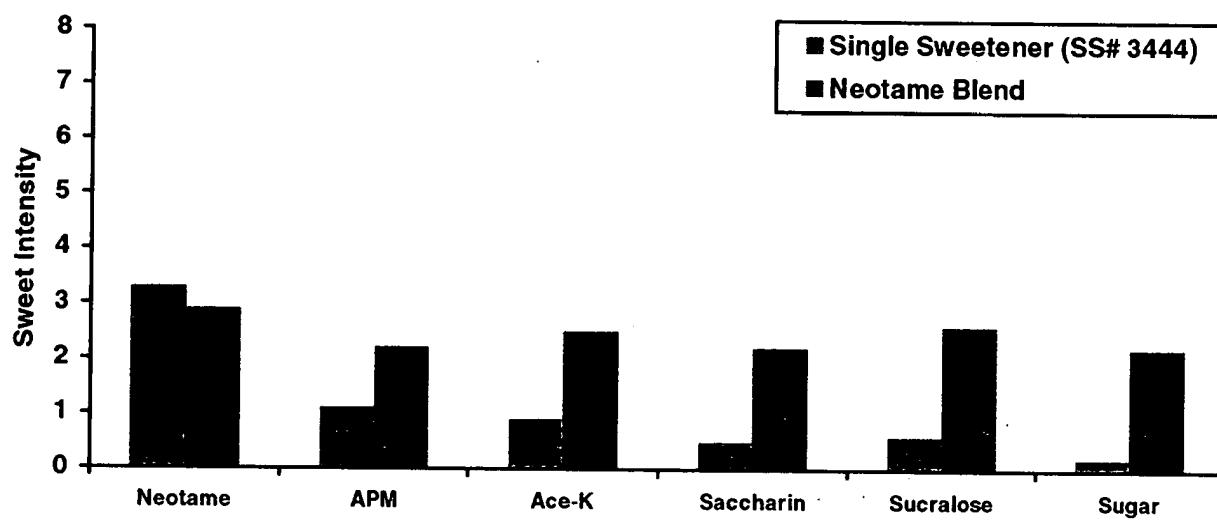
- Graph 1: Sweetness vs. Chew Time by Sample
- Graph 2: Sweetness at 20 minutes - Single Sweeteners vs. NTM Blends
- Graph 3: Sweetness vs. Chew Time - APM vs. NTM/APM
- Graph 4: Sweetness vs. Chew Time - Ace-K vs. NTM/Ace-K
- Graph 5: Sweetness vs. Chew Time - Saccharin vs. NTM/Saccharin
- Graph 6: Sweetness vs. Chew Time - Sucralose vs. NTM/Sucralose
- Graph 7: Sweetness vs. Chew Time - Sugar vs. NTM/Sugar
- Graph 8: Minty Flavor vs. Chew Time by Sample

Table 1: Summary of Attribute Mean Ratings by Chew Time

**Graph 1**  
**Sweetness Over Chew Time**

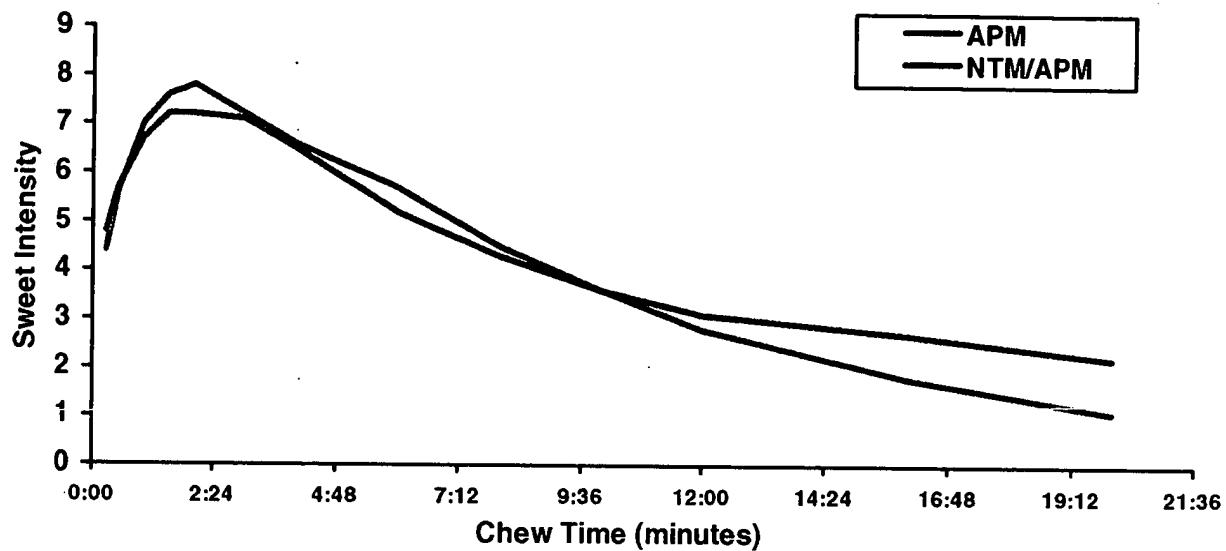


**Graph 2**  
**Sweetness @ 20:00 Chew Time**

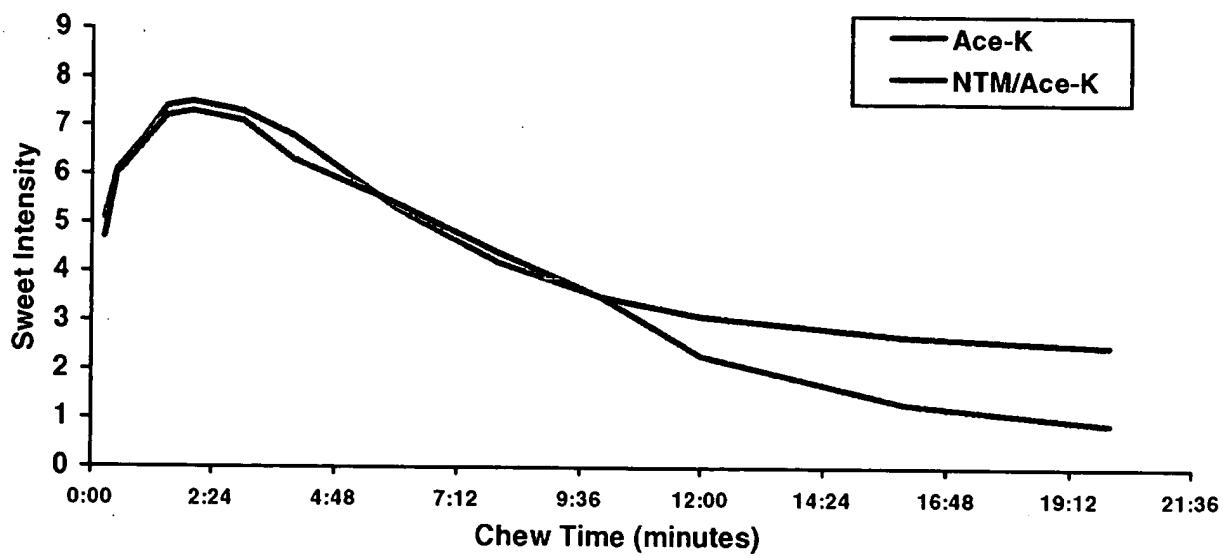


Note: Both bars above "Neotame" represent 100% neotame and not a blend.

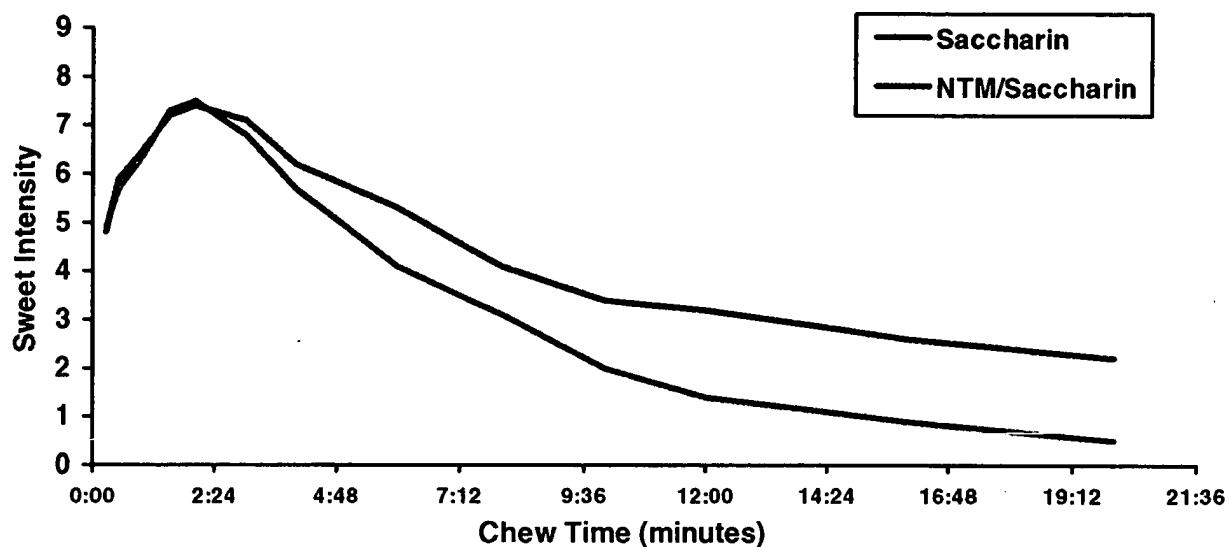
**Graph 3**  
**Sweetness Over Chew Time**



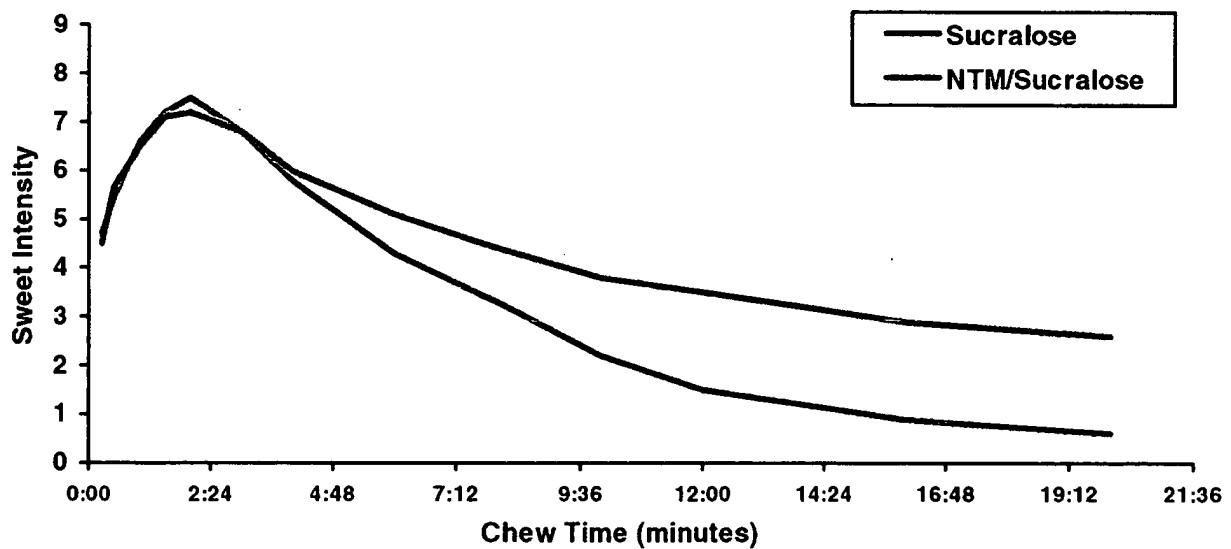
**Graph 4**  
**Sweetness Over Chew Time**



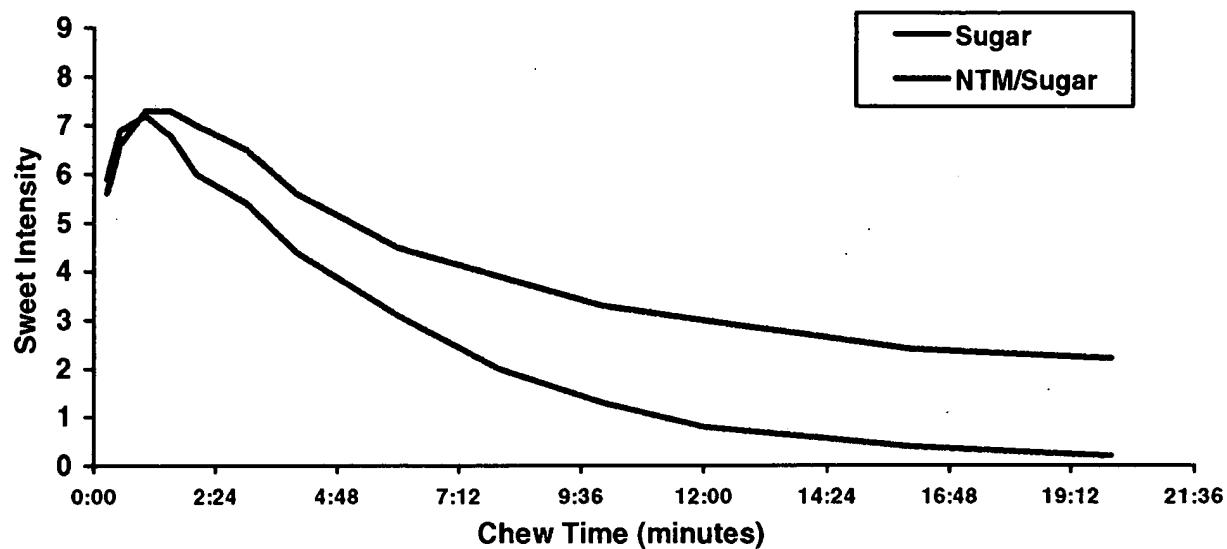
**Graph 5**  
**Sweetness Over Chew Time**



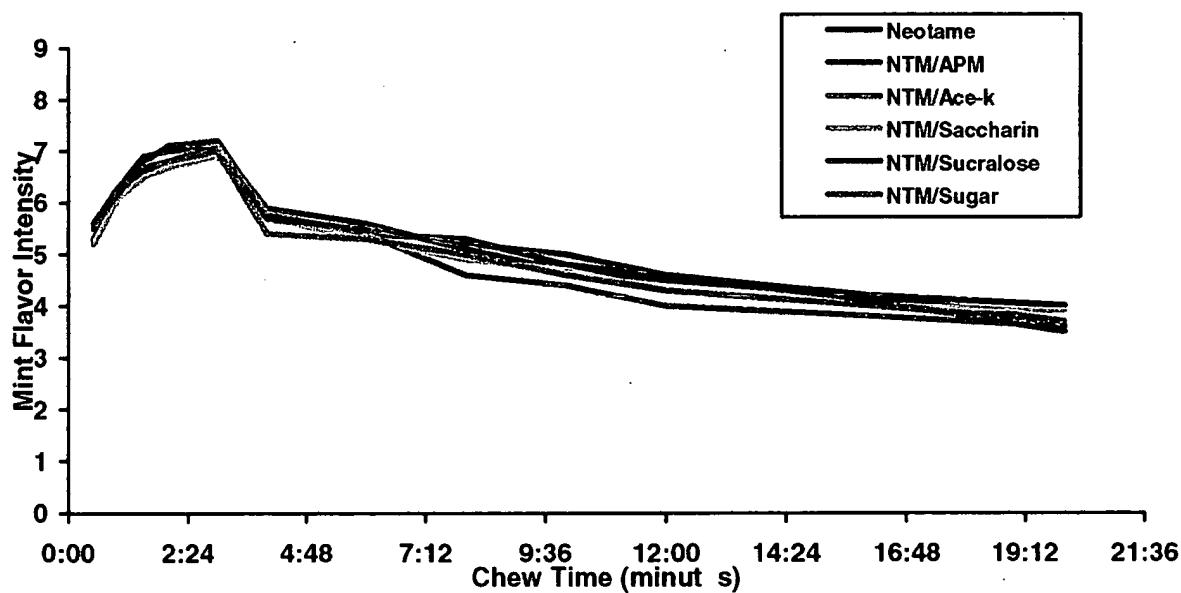
**Graph 6**  
**Sweetness Over Chew Time**



**Graph 7**  
**Sweetness Over Ch w Time**



**Graph 8\***  
**Minty Flavor Over Time**



\* There is a drop in mint scores at 4 minutes chew time because of the manner in which the data was collected. From 15 seconds through 3 minutes, the minty and cooling attributes were rated as one; from 4 minutes through 20 minutes, they were rated separately.

**TABLE 1**  
**NEOTAME IN CHEWING GUM**  
**SUMMARY OF ATTRIBUTE MEAN RATINGS BY CHEW TIME**  
n=8 with 2 reps   SS#3494(01-02)   Test Dates: 2/22/00 - 2/25/00

<b>Attribute</b>	<b>NTM</b>	<b>NTM/ APM</b>	<b>NTM/ Ace-K</b>	<b>NTM/ Saccharin</b>	<b>NTM/ Sucratose</b>	<b>NTM/ Sugar</b>
Sweet 0:15	4.5 A	4.8 A	4.7 A	4.8 A	4.5 A	5.6 B
Sweet 0:30	5.8 a	5.7 a	6.0 a	5.9 a	5.7 a	6.6 b
Sweet 1:00	6.7	6.7	6.6	6.5	6.5	7.3
Sweet 1:30	7.4	7.2	7.2	7.2	7.1	7.3
Sweet 2:00	7.6 C	7.2 AB	7.3 AB	7.4 BC	7.2 AB	7.0 A
Sweet 3:00	7.1 C	7.1 C	7.1 B	7.1 BC	6.8 AB	6.5 A
Sweet 4:00	6.3 C	6.5 C	6.3 C	6.2 BC	6.0 B	5.6 A
Sweet 6:00	5.5 b	5.2 b	5.4 b	5.3 b	5.1 b	4.5 a
Sweet 8:00	4.9	4.3	4.4	4.1	4.4	3.9
Sweet 10:00	4.4 b	3.6 a	3.5 a	3.4 a	3.8 a	3.3 a
Sweet 12:00	4.1 b	3.1 a	3.1 a	3.2 a	3.5 a	3.0 a
Sweet 16:00	3.5 B	2.7 A	2.7 A	2.6 A	2.9 A	2.4 A
Sweet 20:00	2.9	2.2	2.5	2.2	2.6	2.2
Bitter 0:15	0.1	0.3	0.1	0.1	0.2	0.2
Bitter 0:30	0.2	0.3	0.5	0.3	0.4	0.4
Bitter 1:00	0.2 a	0.3 ab	0.5 c	0.4 bc	0.4 bc	0.5 bc
Bitter 1:30	0.2	0.3	0.6	0.5	0.3	0.4
Bitter 2:00	0.4	0.4	0.5	0.4	0.4	0.4
Bitter 3:00	0.5 BC	0.3 A	0.6 BC	0.5 AB	0.5 BC	0.6 C
Bitter 4:00	0.6	0.6	0.7	0.5	0.7	0.7
Bitter 6:00	0.7	0.6	0.5	0.6	0.6	0.8
Bitter 8:00	0.7	0.7	0.6	0.6	0.6	0.8
Bitter 10:00	0.5 B	0.6 A	0.8 C	0.7 AB	0.7 AB	0.9 C
Bitter 12:00	0.8 ab	0.7 a	0.8 bc	0.7 ab	0.6 a	1.0 c
Bitter 16:00	0.6	0.7	0.8	0.7	0.6	0.9
Bitter 20:00	0.7	0.8	0.8	0.7	0.6	0.7

Mean ratings are based on a 15-unit intensity scale where: 0=None and 15=Extreme.

Means sharing a common lower case letter do not differ significantly where  $p<0.10$ .

Means sharing a common UPPER CASE letter do not differ significantly where  $p<0.05$ .

**TABLE 1 (cont'd.)**

<b>Attribute</b>	<b>NTM</b>	<b>NTM/ APM</b>	<b>NTM/ Ace-K</b>	<b>NTM</b>	<b>NTM/ Saccharin</b>	<b>NTM/ Sucratose</b>	<b>NTM/ Sugar</b>
Minty 0:15	4.2 a	4.3 a	4.4 a	4.3 a	4.4 a	4.4 a	4.7 b
Minty 0:30	5.3	5.3	5.5	5.2	5.6	5.6	5.5
Minty 1:00	6.2	6.1	6.3	6.1	6.3	6.3	6.2
Minty 1:30	6.8	6.6	6.9	6.5	6.8	6.8	6.7
Minty 2:00	7.1	6.8	7.0	6.7	7.1	7.1	6.8
Minty 3:00	7.2	7.1	7.1	6.9	7.0	7.0	7.0
Minty 4:00	5.8	5.9	5.8	5.7	5.7	5.7	5.4
Minty 6:00	5.4	5.6	5.4	5.3	5.5	5.5	5.3
Minty 8:00	5.3	5.1	4.6	4.9	5.2	5.2	5.0
Minty 10:00	4.8	4.7	4.4	4.7	5.0	5.0	4.6
Minty 12:00	4.6	4.5	4.0	4.3	4.6	4.6	4.3
Minty 16:00	4.2	4.2	3.8	4.0	4.1	4.1	4.0
Minty 20:00	4.0	3.7	3.6	3.9	3.5	3.5	3.7
Cool 0:15	4.2 a	4.3 a	4.4 a	4.3 a	4.4 a	4.4 a	4.7 b
Cool 0:30	5.3	5.3	5.5	5.2	5.6	5.6	5.5
Cool 1:00	6.2	6.1	6.3	6.1	6.3	6.3	6.2
Cool 1:30	6.8	6.6	6.9	6.5	6.8	6.8	6.7
Cool 2:00	7.1	6.8	7.0	6.7	7.1	7.1	6.8
Cool 3:00	7.2	7.1	7.1	6.9	7.0	7.0	7.0
Cool 4:00	6.8	6.7	6.9	6.6	6.5	6.5	6.6
Cool 6:00	6.7	6.7	6.5	6.5	6.6	6.6	6.5
Cool 8:00	6.7	6.6	6.7	6.6	6.7	6.7	6.5
Cool 10:00	6.6	6.6	6.4	6.4	6.5	6.5	6.5
Cool 12:00	6.4	6.3	6.0	6.4	6.2	6.2	6.3
Cool 16:00	6.0	6.0	5.8	6.1	5.9	5.9	6.0
Cool 20:00	5.4	5.6	5.3	5.5	5.3	5.3	5.4

Mean ratings are based on a 15-unit intensity scale where: 0=None and 15=Extreme.

Means sharing a common lower case letter do not differ significantly where  $p<0.10$ .

Means sharing a common UPPER CASE letter do not differ significantly where  $p<0.05$ .